

**COMPOSITIONS FOR CHEMICAL-MECHANICAL PLANARIZATION  
OF NOBLE-METAL-FEATURED SUBSTRATES, ASSOCIATED METHODS, AND  
SUBSTRATES PRODUCED BY SUCH METHODS**

Robert J. Small

Zhefei J. Chen

**ABSTRACT OF THE DISCLOSURE**

[00145] A composition for chemical-mechanical planarization comprises periodic acid and an abrasive present in a combined amount sufficient to planarize a substrate surface having a feature thereon comprising a noble metal, noble metal alloy, noble metal oxide, or any combination thereof. In one embodiment, the periodic acid is present in an amount in a range of from about 0.05 to about 0.3 moles/kilogram, and the abrasive is present in an amount in a range of from about 0.2 to about 6 weight percent. In another embodiment, the composition further comprises a pH-adjusting agent present in an amount sufficient to cause the pH of the composition to be in a range of from about pH 5 to about pH 10, or of from about pH 1 to about pH 4.

[00146] A method for planarizing a substrate surface having a feature thereon comprising at least one noble metal, noble metal alloy, or noble metal oxide, or a combination thereof, comprises providing a composition or slurry comprising periodic acid and an abrasive in a combined amount sufficient to planarize the substrate surface, and polishing the surface with the slurry. A substrate produced by such a method is also provided.